



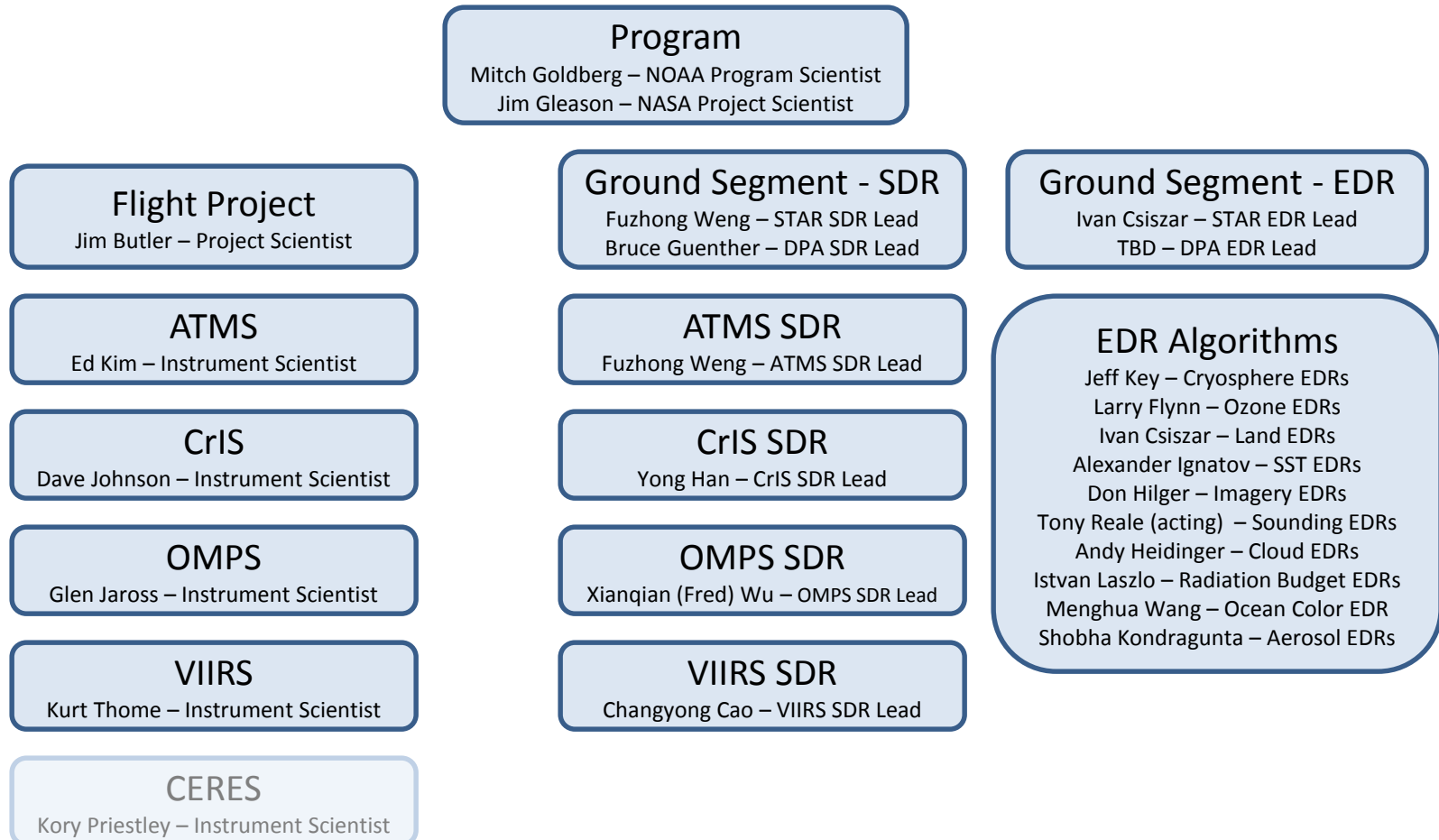
# **Highlights on Suomi National Polar-orbiting Partnership (NPP) Satellite Sensor Data Record (SDR) Science and Products**

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*With Contributions from JPSS CalVal Team Members*

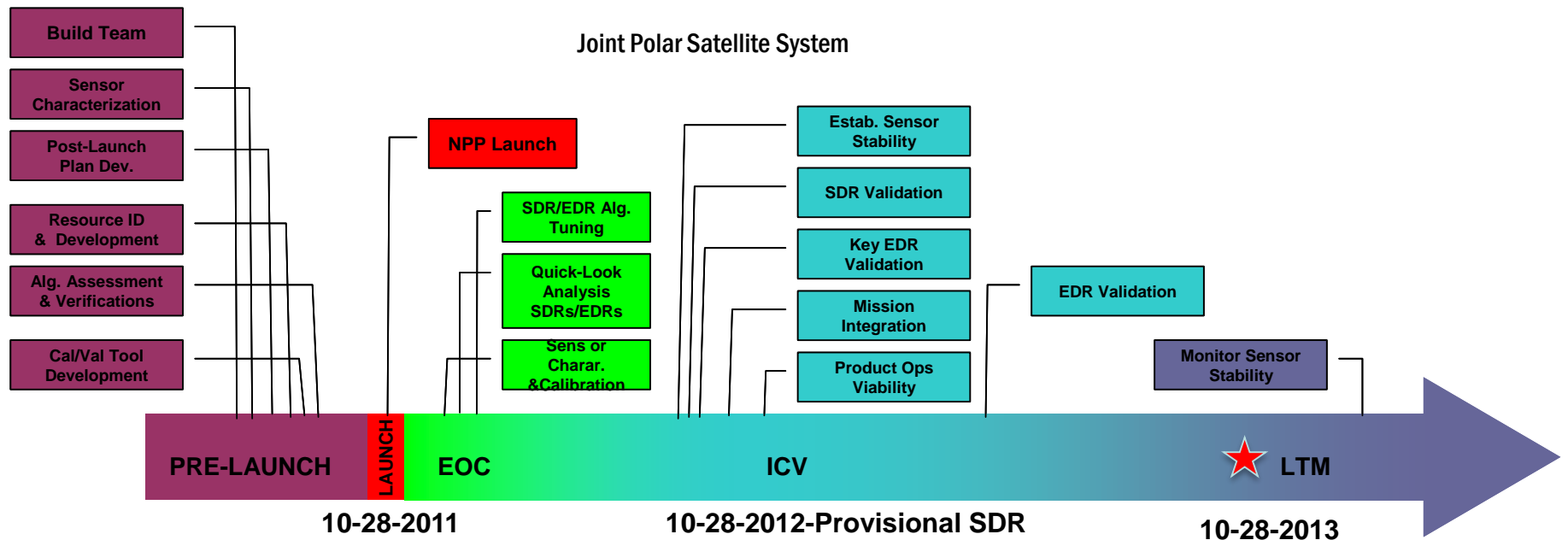
*Presented @ SNPP SDR Science and Product Review*  
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# JPSS Science POCs and Leads



# Suomi NPP Calibration/Validation

- Four Phases of Cal/Val:
  1. Pre-Launch; all time prior to launch – Algorithm verification, sensor testing, and validation preparation
  2. Early Orbit Check-out (first 30-90 days) – System Calibration & Characterization
  3. Intensive Cal/Val (ICV); extending to approximately 24 months post-launch – xDR Validation
  4. Long-Term Monitoring (LTM); through life of sensors after ICV
- For each phase:
  - Exit Criteria established
  - Activities summarized
  - Products mature through phases independently



# 2012 SNPP SDR Panel Reviews:

## Overall Assessment of the Teams

- Meeting was well organized; opening presentations focused on user feedback followed by overall assessment by each team
- The expertise and composition of the SDR teams are outstanding and generally well managed.
  - Team comprised of government, academia and industry
- Presentations provided an exceptional level of detail and incorporated lessons learned from past/current NOAA and NASA cal/val activities including POES and EOS.
- Task results were generally well described.

# 2012 SNPP SDR Panel Reviews:

## Overall Assessment of the Teams

- Final provisional maturity assessment conditional on getting off-line code results into IDPS
  - VIIRS, CrIS and ATMS SDRs on track for IDPS provisional maturity; generally all instruments meeting performance specifications
  - ATMS striping indicates a new specification may be needed after root cause determination
  - OMPS SDR needs more work; clear direction and expectations need to be reinforced to OMPS SDR team members
- Hard to distinguish off-line code results vs. IDPS results.
- Need very clear documentation describing current shortfalls needed to be addressed to get to provisional and to validated maturity phases.
  - Request to DPA and STAR to provide this to the Review Panel in letter form.
- Need team consensus assessment, including remaining issues and remaining work.
  - Request concurrence from entire team, and minority report, if applicable
  - Dissenting opinions should be identified, mitigated and resolution pursued

# 2012 SNPP SDR Panel Reviews:

## Overall Assessment of the Teams

- Use canary EDRs for SDR assessments (e.g., cloud liquid water, ocean color, SST), and data impact studies.
- Team provides valuable lessons learned from NPP to improve instruments for JPSS-1 (if possible) and JPSS-2.
  - Need this information to be documented.
- Moving from Provisional to Validated.
  - Upon reaching provisional status the teams direction should be to consolidate tasks (minimize duplication) and come to a consensus on calibration algorithms to reach validation status.

# Suomi NPP TDR/SDR Algorithm Schedule

<b>Sensor</b>	<b>Beta</b>	<b>Provisional</b>	<b>Validated (planned)</b>
<b>CrIS</b>	<b>February 10, 2012</b>	<b>February 6, 2013</b>	<b>January, 2014</b>
<b>ATMS</b>	<b>May 2, 2012</b>	<b>February 13, 2013</b>	<b>January, 2014</b>
<b>OMPS</b>	<b>March 7, 2012</b>	<b>March 12, 2013</b>	<b>January, 2014</b>
<b>VIIRS</b>	<b>May 2, 2012</b>	<b>March 13,, 2013</b>	<b>January, 2014</b>

## Beta

- Early release product.
- Initial calibration applied
- Minimally validated and may still contain significant errors (rapid changes can be expected. Version changes will not be identified as errors are corrected as on-orbit baseline is not established)
- Available to allow users to gain familiarity with data formats and parameters
- Product is not appropriate as the basis for quantitative scientific publications studies and applications

## Provisional

- Product quality may not be optimal
- Incremental product improvements are still occurring as calibration parameters are adjusted with sensor on-orbit characterization (versions will be tracked)
- General research community is encouraged to participate in the QA and validation of the product, but need to be aware that product validation and QA are ongoing
- Users are urged to consult the SDR product status document prior to use of the data in publications
- Ready for operational evaluation

## Validated

- On-orbit sensor performance characterized and calibration parameters adjusted accordingly
- Ready for use in applications and scientific publications
- There may be later improved versions
- There will be strong versioning with documentation

# Major SDR Accomplishments in SNPP CalVal

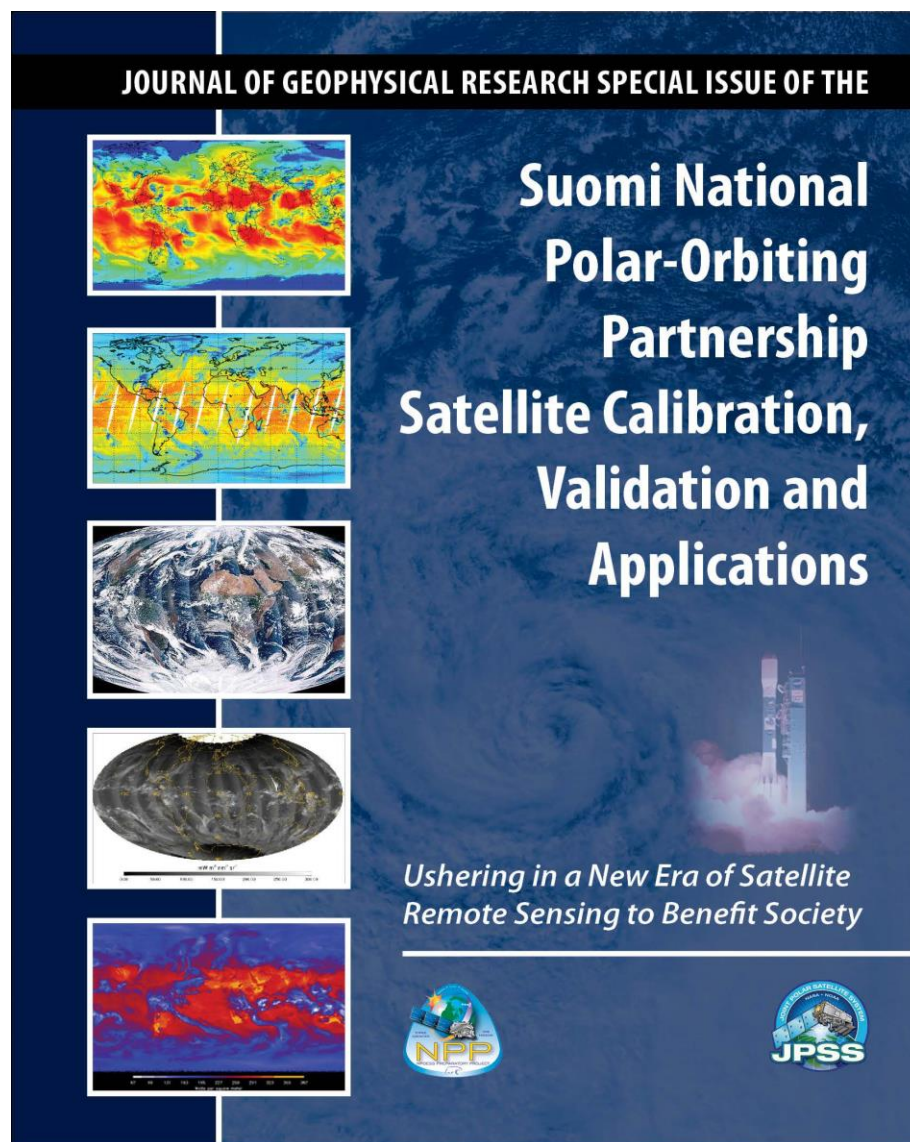
- Robust NOAA Integrated CalVal System (ICVS) for SNPP Long Term Monitoring (LTM)
- Numerous DRs were submitted and the majority of them are closed.
- Stable ATMS SDR system updated with scan angle dependent bias corrections (full conversion from TDR to SDR for KAV bands in MX8.0), lunar correction and striping mitigation algorithms are ready for MX8.2 or higher version.
- Stable CrIS SDR processing system, on-orbit performance significantly exceeds spec., advanced capability for reprocessing and full spectral resolution
- VIIRS reflective solar band automation was implemented in IDPS (MX8.0) DNB straylight correction was implemented
- Transition of NASA OMPS calibration SDR capability for NOAA operation was reviewed and approved. OMPS smear/dark/straylight corrections are mostly resolved.
- Collaborations and interactions between SDR teams and user community are strengthened
- Documentation of all the SDR sciences and operational codes is nearly completed, including ATBD and user manuals
- A lot of peer review publications



# American Geophysical Union (AGU) JGR Special Issue on Suomi NPP CalVal

25 papers have been accepted in AGU Journal Geophysical Research Special Issue on Suomi NPP satellite calibration, validation and applications. 10 papers are still in peer-review process with major or minor revision

*Guest Editor: Fuzhong Weng*



# 2013 SNPP SDR Review Focus

- Actions from 2012 review panel recommendations
- SDR science advances and algorithm maturity
- Documentation (e.g. ATBD, user guides, error budget)
- Feedbacks from user community

# 2013 Major Review Materials

- Calibration Requirement
- SDR validated maturity criteria
- SDR Algorithm Theoretical Basis Document (ATBD)
- SDR User Guides
- SDR team lead presentations
- SDR error budget analysis
- STAR FTP site for all the presentations  
<http://www.star.nesdis.noaa.gov/smcd/spb/nsun/snpp/index.php>